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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Xin Jin

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EXAMINER

NOTE, JANIS L

ART UNIT

PAPER NUMBER

1756

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/615,089

Applicant(s)

JIN ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-51 and 53-86 is/are pending in the application.
- 4a) Of the above claim(s) 1-13, 15, 26, 40-51, 53 and 63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-25, 27-39, 54-62, 64-80 and 83-86 is/are rejected.
- 7) ☒ Claim(s) 81 and 82 is/are objected to.
- 8) ☒ Claim(s) 1-13, 15-51 and 53-86 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/17/06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

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1. The examiner acknowledges the amendments to claims 3, 16, 19, 21, 22, 32, 37, 38, 45, 54, 58, 59, 69, 70, 74, 77, and 78, and the cancellation of claims 14 and 52 filed on Jul. 28, 2006. Claims 1-13, 15-51, and 53-86 are pending.

The "Amendment to the specification" section filed on Nov. 15, 2006, has been entered.

2. The "Amendment to the specification" section and the "Amendment to the claims" section filed on Apr. 17, 2006, did not comply with 37 CFR 1.121 for the reasons discussed in the Notice of non-compliant amendment mailed on Jun. 30, 2006. The "Amendment to the specification" section filed on Jul. 28, 2006, did not comply with 37 CFR 1.121 for the reasons discussed in the second Notice of non-compliant amendment mailed on Oct 13, 2006. Accordingly, the "Amendment to the specification" sections filed on Apr. 17, 2006, and on Jul. 28, 2006, and the "Amendment to the claims" section filed on Apr. 17, 2006, have not been entered.

3. Applicants' election without traverse of the invention of Group II, claims 14, 16-39, 52, and 54-86, and the elected species identified in the reply filed on Oct. 24, 2005, were

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acknowledged in the office action mailed on Jan. 12, 2006, paragraphs 1 and 2.

Claims 1-13, 15, 26, 40-51, 53, and 63 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and nonelected species of invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on Oct. 24, 2005.

4. The examiner has crossed out the references to Bellmann, Chem. Mater., 2000, Vol. 12, No. 5, pp. 1349-1353, and to Rao, Eur. Polym. J., Vol. 25, No. 6, 1989, pp. 605, listed on the form PTO-1449 in the information disclosure statement (IDS) filed on Apr. 17, 2006. The examiner has already considered those references, which were previously listed on the form PTO-1449 filed on Dec. 6, 2004. See the examiner-initialed form PTO-1449 filed on Dec. 6, 2004, attached to the office action mailed on Jan. 12, 2006.

5. The objection to the specification set forth in the office action mailed on Jan. 12, 2006, paragraph 4, item (1), has been withdrawn in response to the amended paragraph at page 4 of the specification, filed on Nov. 15, 2006.

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The objections to the specification set forth in the office action mailed on Jan. 12, 2006, paragraph 5, items (1) to (8), have been withdrawn in response to the amended paragraphs at page 10, 23, and 28 of the specification, filed on Nov. 15, 2006.

The rejections of claims 14, 19, 21, 22, 52, 58, 59, and 74 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Jan. 12, 2006, paragraph 7, have been withdrawn in response to the cancellation of claims 14 and 52 and the amendments to claims 19, 21, 22, 58, 59, and 74 filed on Jul. 28, 2006.

The objections to claims 37-39, 52, and 77-79 set forth in the office action mailed on Jan. 12, 2006, paragraph 8, have been withdrawn in response to the cancellation of claim 52 and the amendments to claims 37, 38, 77, and 78 filed on Jul. 28, 2006.

The rejection of claims 14, 16-21, 23-25, 27-29, 36-39, and 52 under 35 U.S.C. 102(b)/103(a) over US 2001/0017155 A1 (Bellmann) set forth in the office action mailed on Jan. 12, 2006, paragraph 19, has been withdrawn in response to the amendment to claim 16 filed on Jul. 28, 2006. That amendment added the limitation that the silsesquioxane comprises the condensed reaction product of the charge transport polymer and

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from "about 5 to about 30 weight percent of colloidal silica based on the weight of the charge transport polymer." Bellmann does not disclose or suggest forming a condensed reaction with colloidal silica as recited in instant claim 16.

6. The amendment filed on Nov. 15, 2006, is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The amended paragraph at page 11 of the specification states that the "condensed reaction product of the charge transport polymer of Formula 1 below of the invention . . . [has] a thickness of from about 0.5 to about 10 microns . . . [i]f the silsesquioxane is to be used as the primary charge transport layer . . . the condensed reaction product of the charge transport polymer of Formula (1) below can be as high as about 40 microns."

The originally filed specification does not provide antecedent basis for said thickness of said condensed reaction product. Rather, the originally filed specification at page 11, lines 7-13, stated that "[o]vercoats comprising the

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silsesquioxanes of the invention desirably have a thickness of from about 0.5 to about 10 microns . . . [i]f the silsesquioxane is to be used as the primary charge transport layer . . . the thickness of the silsesquioxane layer can be as high as about 40 microns" (emphasis added). Originally filed claims 84 and 85 recite that the "first charge transport layer comprising the condensed reaction product of claim 54 has a thickness of about 0.5 microns to about 10 microns [claim 85: from about 1 micron to about 3 microns]." Originally filed claim 86 recites that the "first charge transport layer has a thickness of up to about 40 microns."

Applicants are required to cancel the new matter in the reply to this Office Action.

7. The disclosure is objected to because of the following informalities:

(1) The use of trademarks, e.g., Ludox [sic: LUDOX] at page 41, line 8, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

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Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner, which might adversely affect their validity as trademarks.

(2) The amended paragraph at page 11 states that the "condensed reaction product of the charge transport polymer of Formula 1 below of the invention . . . [has] a thickness of from about 0.5 to about 10 microns . . . [i]f the silsesquioxane is to be used as the primary charge transport layer . . . the condensed reaction product of the charge transport polymer of Formula (1) below can be as high as about 40 microns." It is not clear how the condensed reaction product, i.e., a polymer, can have a thickness. Nor is it clear how the condensed reaction product can have a thickness up to 40 microns. Nor is it clear what is the relation of the thickness of the condensed reaction product when a primary charge transport layer comprises a silsesquioxane.

Appropriate correction is required.

Applicants' arguments filed on Jul. 28, 2006, as applicable to item (1) above have been fully considered but they are not persuasive.

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Applicants assert that the amendment to the specification overcomes the objection.

However, for the reasons discussed in item (1) above, that amendment did not capitalize all of the trademarks disclosed in the instant specification. Accordingly, the objection stands.

8. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The recitations in claims 84-86 lack antecedent bases in the specification. See amended paragraph at page 11 of specification, filed on Nov. 15, 2006, which discloses that "overcoats or the first charge transport layer or the condensed reaction product of the charge transport layer of Formula 1 below of the invention" (emphasis added) have the thickness recited in instant claims 84 and 85, not the first charge transport layer comprising the condensed reaction product of the charge transport polymer recited in instant claim 54. The specification also discloses that a primary charge transport layer comprising the silsesquioxane "or the condensed reaction product of the charge transport polymer of Formula 1 below" can have a thickness as recited in instant claim 86, not a charge

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transport layer comprising the condensed reaction product of the charge transport polymer recited in instant claim 54.

Applicants' arguments filed Jul. 28, 2006, have been fully considered but they are not persuasive.

Applicants assert that the amended paragraph at page 11 of the specification overcomes the objection.

However, for the reasons discussed in the above objection, the amended paragraph does not overcome the objection.

9. The following is a quotation of the first paragraph of 35.

U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 16-32 and 54-86 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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(1) Instant claim 16 and claims dependent thereon recite that the silsesquioxane comprises the "condensed reaction product" of a charge transport polymer comprising the structural unit described in claim 16 and from "about 5 to about 30 weight percent of colloidal silica based on the weight of the charge transport polymer" (emphasis added).

The originally filed specification does not provide an adequate written description of said condensed reaction product. The originally filed specification at page 24, lines 20-21, states that "up to about 30 weight percent of colloidal silica, based on the amount of silsesquioxane is added to the mixture. More preferably, the amount of added colloidal silica is about 5 to about 10 weight percent" (emphasis added). The originally filed specification does not disclose that the amount of colloidal silica recited in instant claim 16 is based on the weight of charge transport polymer, but on the weight of the silsesquioxane.

(2) Instant claim 54 and claims dependent thereon recite a "condensed reaction product" of a charge transport polymer comprising the structural unit described in claim 54 and from "about 5 to about 30 weight percent of colloidal silica based on the weight of the charge transport polymer" (emphasis added).

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The originally filed specification does not provide an adequate written description of said condensed reaction product. The originally filed specification at page 24, lines 20-21, states that "up to about 30 weight percent of colloidal silica, based on the amount of silsesquioxane is added to the mixture. More preferably, the amount of added colloidal silica is about 5 to about 10 weight percent" (emphasis added). The originally filed specification does not disclose that the amount of colloidal silica recited in instant claim 54 is based on the weight of charge transport polymer, but on the weight of the silsesquioxane. Instant claim 54 does not recite the presence of a silsesquioxane.

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 54, 55, 59-62, 64-73, 75-80, and 83-86 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,495,300 B1 (Qi), as evidenced by US 5,930,090 (Beaurline) and US 4,082,710 (Vrancken).

Qi discloses an electrophotographic imaging element comprising an electrically conductive layer, a barrier layer, a

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charge generating layer, a charge transporting layer, and an overcoat layer comprising the crosslinked composite polysiloxane-silica generated from the reaction of 0.56 g of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a), 0.24 g of the organosilane compound 3-aminopropyltrimethoxysilane and 0.016 g of hydrophilic silica particles associated with the tradename AEROSIL 200 obtained from Degussa in a mixture of ethanol/water. The overcoat layer has a layer thickness of about 5 microns. See col. 16, lines 62-67, and example VI at cols. 22-23. The polymer of formula (IV-a) comprises 0.02 mole fraction of the monomer 3-(trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of the monomer comprising a hole transporting moiety, vinylcarbazole. See col. 5, lines 17-18, and example 1 at cols. 19-20. The amount of silica particles in the reaction product is about 2.8 wt% based on the weight of the silyl-functionalized hydroxyalkyl polymer. The amount of about 2.8 wt% is within the amount range of "about 5 to about 30 weight percent based on the weight of the charge transport polymer" recited in instant claim 54. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Qi amount of about 2.8 wt% from the lower limit, "about 5 weight percent" recited

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in instant claim 54. Thus, the Qi silica particles amount of about 2.8 wt% is within the amount range recited in instant claim 54. According to Qi, in the crosslinking process, the silyl groups of the organosilane and polymer undergo hydrolysis to obtain hydroxysilyl groups. The hydroxysilyl groups condense with the hydroxysilyl groups on the silica particle surface to form siloxane (Si-O-Si) bonds. See col. 15, lines 53-62, col. 16, lines 13-55. Qi does not identify the silica particles associated with the tradename AEROSIL 200 obtained from Degussa as "colloidal silica" as recited in instant claim 54. However, silica particles associated with the tradename AEROSIL 200 are well known as "colloidal silica." See Vrancken, col. 22, line 33, which identifies the tradename AEROSIL 200 from Degussa as a "colloidal silica"; and Beaurline, col. 3, lines 13-23, which also identifies the tradename AEROSIL 200 obtained from Degussa as a "colloidal silica," and states that it is used as a gelling agent. Accordingly, it is reasonable to conclude that the Qi silica particles associated with the tradename AEROSIL 200 from Degussa meet the "colloidal silica" limitation recited in instant claim 54. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

The imaging member layer structure meets the layer structure limitations recited in instant claims 54, 75, 80, 83,

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84, and 86. The overcoat layer thickness of "about 5 microns" is within the layer thickness range of "about 1 micron to about 3 microns" (emphasis added) recited in instant claim 85. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Qi overcoat layer thickness of about 5 microns from the upper limit of "about 3 microns" of the layer thickness range recited in instant claim 85. Thus, the Qi layer thickness of about 5 microns is within the layer thickness range recited in instant claim 85. The method of preparing the crosslinked reaction product, i.e., condensed reaction product, of the silyl-functionalized hydroxyalkyl polymer meets the process limitations recited in instant in instant claims 76-79. The silyl-functionalized hydroxyalkyl polymer meets the polymer compositional limitations recited in instant claims 54, 55, 59, and 64-66. The 3-aminopropyltrimethoxysilane meets the optional silane monomer limitations recited in instant claims 54 and 67-71. Qi further discloses that the monomer 3-(trimethoxysilyl)propylmethacrylate may be present in mole fractions of from about 0.001 to about 0.5. Col. 15, lines 38-39. The upper limit, about 0.5 mole fraction, of the mole fraction of said 3-(trimethoxy-silyl)propylmethacrylate meets the ranges recited in instant claims 60-62. Qi also

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discloses that the organosilane compound can equally be methyltrimethoxysilane, which meets the optional silane monomer limitations recited in instant claims 72 and 73. Col. 11, line 56.

Qi does not identify its overcoat layer as a charge transport layer as recited in the instant claims. However, for the reasons discussed above, the Qi overcoat layer meets the first charge transport layer compositional limitations recited in the instant claims. Thus, it is reasonable to conclude that the Qi overcoat layer has charge transporting properties. The burden is on applicants to prove otherwise. Fitzgerald, supra.

13. Claims 16, 17, 22-25, and 27-39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Qi, as evidenced by Beaurline, Vrancken, and applicants' admissions at page 40, lines 8-14, of the specification (applicants' admission I).

Qi, as evidenced by Beaurline and Vrancken, discloses the crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of formula (IV-a) with the organosilane compound 3-aminopropyltrimethoxysilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by

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reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole. The discussion of said crosslinked composite in paragraph 12 above is incorporated herein by reference.

Qi does not identify its crosslinked composite as a silsesquioxane as recited in the instant claims. However, the instant specification at page 40, lines 8-14, provides a structure of a silsesquioxane. The Qi crosslinked composite has the structure shown at col. 9, which is similar to that shown at page 40 of the instant specification. Accordingly, it is reasonable to presume that the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

14. Claims 54-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by Beaurline and Vrancken, combined with US 5,427,880 (Tamura), as evidenced by Diamond, Handbook of Imaging Materials, p. 426, and Fig. 9.22 at page 430 (Diamond) and US 6,376,695 B1 (Kushibiki).

Qi, as evidenced by Beaurline and Vrancken, discloses an electrophotographic imaging member as described in paragraph 12 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the

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reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting the silyl-containing monomer, 3-(trimethoxysilyl)propylmethacrylate, and the monomer comprising a hole transporting moiety, vinylcarbazole. The organosilane can be methyltrimethoxysilane, which meets applicants' elected species. 3-trimethoxysilyl)propylmethacrylate meets applicants' elected species, methacryloxypropyltrimethoxysilane (MATMS).

Qi does not exemplify a silyl-functionalized hydroxylalkyl polymer obtained from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

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Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). See Tamura, col. 3, lines 20-45, and col. 28, compound no. 124. Di-p-anisylamino styrene meets applicants' elected species. The monomer di-p-anisylamino styrene also meets the monomer limitations recited in instant claims 57 and 58 and the tertiary arylamine charge transport moiety limitation recited in instant claim 74. See the chemical formula CTM I in claim 74. Tamura does not identify the di-p-anisylamino styrene as a monomer comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (III) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the di-p-anisylamino-phenyl moiety of the monomer has an oxidation potential as recited in instant claim 56. However, as discussed above, the di-p-anisylamino phenyl moiety meets the compositional limitations recited in instant claim 74. Kushibiki discloses

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that di-p-anisylamino benzene has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claim 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claim 56. Thus, because the di-p-anisylamino phenyl moiety meets the tertiary arylamine compositional limitations recited in claim 74 and because it has an oxidation potential value that is within the potential range recited in instant claim 56, it is reasonable to presume that the di-p-anisylamino phenyl moiety in the Tamara di-p-anisylamino styrene monomer has an oxidation potential as recited in instant claim 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-anisylamino styrene as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member

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that has the benefits disclosed by Qi and that has improved charge transporting characteristics as disclosed by Tamura.

15. Claims 56-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by Beaurline and Vrancken, combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi, as evidenced by Beaurline and Vrancken, discloses an electrophotographic imaging member as described in paragraph 12 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting the monomer, 3-(trimethoxysilyl)propylmethacrylate, and the monomer comprising a hole transporting moiety, vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a monomer comprising a tertiary arylamine charge transport moiety as recited in instant claims 57, 58, and 74. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. Qi teaches that the vinyl-containing

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monomer can be a monomer comprising an ester group. Col. 6, line 60. According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses (meth)acrylate monomers comprising a triphenylamino moiety, which meet the monomer limitations recited in instant claims 57, 58, and 74. See Tamura, formula (I) at col. 3, lines 5 and 24-39, and, for example, compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24. Tamura does not identify said (meth)acrylate monomers as monomers comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (I) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

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Tamura also does not disclose that the triphenylamino moieties of the (meth)acrylate monomers have an oxidation potential as recited in instant claim 56. However, as discussed above, the triphenylamino moieties meet the compositional limitations recited in instant claim 74. Kushibiki discloses that triphenylamino moiety in Tamura compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 has an oxidation potential of 0.86 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claim 56. Kushibiki, col. 14, lines 25-35. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claim 56. Thus, because the triphenylamino moiety in Tamura compound nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 meets the tertiary arylamine compositional limitations recited in claim 74 and because it has an oxidation potential value that is within the potential range recited in instant claim 56, it is reasonable to presume that the triphenylamino moiety in the Tamara compounds nos. 1, 3, 4, 11, 14, 19, 20, 23, and 24 has an oxidation potential as recited in instant claim 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura

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(meth)acrylate monomer comprising a triphenylamine moiety as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer of the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an electrophotographic imaging member that has the benefits disclosed by Qi and that has improved charge transporting characteristics as disclosed by Tamura.

16. Claims 16-25 and 27-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by Beaurline, Vrancken, and applicants' admissions I, combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi, as evidenced by Beaurline, Vrancken, and applicants' admission I, discloses a crosslinked composite polysiloxane-silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles as described in paragraph 13 above, which is incorporated herein by reference. For the reasons discussed in paragraph 13 above, the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The polymer of formula (IV-a) is obtained by

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reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole. The organosilane can be methyltrimethoxysilane, which meets applicants' elected species. 3-trimethoxysilyl)-propylmethacrylate meets applicants' elected species, methacryloxypropyltrimethoxysilane (MATMS).

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. According to Qi, when the electrophotographic imaging member comprises an overcoat layer comprising the crosslinked composite polysiloxane-silica, the imaging member provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). Di-p-anisylamino styrene meets applicants' elected species. The discussions of Tamura, Diamond, and Kushibiki in paragraph 14 above are incorporated herein by reference. Di-p-anisylamino

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styrene also meets the monomer limitations recited in instant claims 19-21. See the chemical formula CTM I in claim 19.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-anisylamino styrene as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

17. Claims 16-25 and 27-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by Beaurline, Vrancken, and applicants' admissions I, combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi as evidenced by Beaurline, Vrancken, and applicants' admissions I, discloses a crosslinked composite polysiloxane-

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silica generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with the organosilane in a mixture of ethanol/water and silica particles as described in paragraph 13 above, which is incorporated herein by reference. For the reasons discussed in paragraph 13 above, the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The polymer of formula (IV-a) is obtained by reacting the monomer 3-(trimethoxysilyl)propylmethacrylate and the monomer comprising a hole transporting moiety, vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a monomer comprising a tertiary arylamine as recited in instant claims 19-21. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. Qi teaches that the vinyl-containing monomer can be a monomer comprising an ester group. Col. 6, line 60. According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

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Tamura discloses the (meth)acrylate monomers comprising a triphenylamino moiety, which meet the monomer limitations recited in instant claims 19-21. The discussions of Tamura, Diamond, and Kushibiki in paragraph 15 above are incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura (meth)acrylate monomer comprising a triphenylamine moiety as the monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining an crosslinked polysiloxane-silica composite that has excellent adhesion with a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

18. Applicants' arguments filed on Jul. 28, 2006, as applicable to the rejections over Qi in paragraphs 12-17 above have been fully considered but they are not persuasive.

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Applicants assert that the Qi silica particles associated with the tradename AEROSIL 200 are not colloidal silica, but are a fumed silica. Applicants also assert that AEROSIL 200 has a pH of "about 4 . . . [and a] pH of 4 will not catalyze the sol-gel condensation reaction (curing)." Applicants assert that colloidal silica is a dispersion that is typically basic. Applicants further assert that in its invention, "the combination of acetic acid and sodium oxide on the colloidal silica is the real catalyst. Acetic acid reacts with the sodium oxide (or sodium hydroxide) to form sodium acetate," which is detailed in US 3,986,997 to Clark.

Applicants' assertions are not persuasive. Applicants' assertion that the Qi silica particles associated with the tradename AEROSIL 200 from Degussa are not a colloidal silica is mere attorney argument. Applicants have not provided any evidence to support their assertion. As noted in paragraph 12 above, the prior art identifies silica particles associated with the tradename AEROSIL 200 from Degussa as a "colloidal silica." See the cited disclosures in Vrancken and in Beaurline. Thus, the preponderance of evidence indicates that the Qi silica particles meet the "colloidal silica" limitation recited in instant claims 16 and 54. Furthermore, as discussed in paragraph 12 above, the Qi crosslinked composite polysiloxane-

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silica is obtained by condensing the hydroxysilyl groups on the surface of the silica particles with the hydroxysilyl groups in the polymer (IVa) and organosilane compound. Qi further teaches that the "presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." Col. 15, lines 65-67. Moreover, applicants cannot argue patentability based on the limitations that are not present in the claims. Instant claims 16 and 54 do not require that the colloidal silica be "basic" or that it comprise sodium oxide or sodium hydroxide. Nor do the claims require the presence of acetic acid to react with the sodium oxide in the colloidal silica to form sodium acetate, which is used as a condensation catalyst. In any event, applicants' own specification at page 24, lines 18-19, indicates that the colloidal silica has either acid or basic groups on its surface, in marked contrast to applicants' current arguments. The specification is far more reliable than arguments presented without an evidentiary foundation - especially when the arguments contradict the teachings in the specification.

Accordingly, for the reasons discussed above and in the rejections over Qi set forth in paragraphs 12-17, supra, the rejections over Qi stand.

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19. Claims 81 and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest the electrophotographic element recited in claims 81 and 82. Qi does not teach or suggest that its charge transport layer in the electrophotographic imaging member, which is located between the charge generating layer and the overcoat layer, can comprise the Qi crosslinked composite polysiloxane-silica or the Qi silyl-functionalized hydroxyalkyl polymer.

20. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLD

Mar. 12, 2007

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